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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/687,762	10/13/2000	Yao-Min Chen	3981-3	1075

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EXAMINER

PHAN, MAN U

ART UNIT PAPER NUMBER

2665

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/687,762

Applicant(s)

CHEN ET AL.

Examiner

Man Phan

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 22-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 15-17 and 22-25 is/are rejected.
- 7) ☒ Claim(s) 7-14, 18 and 26-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment and Argument

1. This communication is in response to applicant's 09/01/2004 Amendment in the application of Chen et al. for a "Interleaved weighted fair queuing mechanism and system" filed 10/13/2000. The proposed amendment to the claims and response have been entered and made of record. Claims 1, 13-18, 22, 30, 31 have been amended and claims 19-21 have been canceled. Claims 1-18 and 22-31 are pending in the application.

In view of applicant's amendment to amend the specification to include the reference sign(s) shown in the drawings. Therefore, these drawings are now complied under 37 CFR 1.83(a).

In view of applicant's amendment to amend the claims 1, 13-14, 30-31, the examiner has withdrawn the objections of record.

2. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C. 103 as discussed below. Applicant's argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons.

3. In response to Applicant's arguments, 37 CFR § 1.111 (B) states, "a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the

requirements of this section.” Applicant has failed to specifically point out how the language of the claims patentably distinguishes them from the references.

4. On page 10, fifth paragraph, applicant asserts that there is no motivation to combine the prior art as proposed in the office action, Duffield et al. (US#6,452,933) with Braff et al. (US#5,166,930), i.e. In response, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Duffield et al. (US#6,452,933) with Braff et al. (US#5,166,930) are applied herein for the teaching of a novel method and system for weighted fair queuing scheduler in routing packets from multiple queues.

5. Applicant's argument with respect to the rejected claims 15-17 (page 10, last paragraph) that the cited references do not disclose the “*epoch queues*” as in the manner claimed. Applicant further alleges that the reference does not identify queues with epoch (page 11, second paragraph). However, Braff et al. (US#5,166,930) discloses in Fig. 5 a block diagram illustrated a slotted packet data system utilizing a scheduling discipline for providing data devices access to such system, in which data packets from a particular channel is inputted into each *epoch queue* (507-510). Each *epoch queue* is then cyclically served exhaustively by outputting the identified data packets to the facility. Data that cannot be placed in the epoch queues is temporarily placed

in an overflow queue. The overflow queue data is subsequently sorted into the epoch queues and transmitted (Col.1, lines 46-48 and Col. 6, lines 38 plus). Applicant asserts that the references fails to disclose the “*interleaving table*” and “*queue sequencer*” as in the manner claimed (page 11, third & fourth paragraph). However, Braff also teaches in Fig. 4 a functional block diagram of a receiver/transmitter pair 201 of trunk interface 130 of Fig. 2 including routing table 403 to determine if the destination address can be reached through this trunk, 404, and the corresponding Channel Identifier (CID) is calculated and assigned to the packet's MID in table 404. If the incoming packet is found to be an EOM and the channel identifier is valid, an invalid channel identifier is assigned to the packet's MID in table 404. Once the channel identifier associated with a packet is found (*identify a queue with a epoch value*), the receiver controller is ready to schedule the transmission of that packet. The receiver controller 402 retrieves and updates all the state information with respect to the channel identifier (i.e., registers 405, 406, 407, 408, 409, 410) to determine the identifier information (i.e., *a pointer to a memory location where the packet should be stored*). That identifier information is passed to the receiver Direct Memory Access (DMA) device 411 and the packet is appropriately stored in one of the N epoch queues (507-509) or the overflow queue 510 in memory 412 (*queue identifier*). Once it is time for the transmission of a packet, the transmitter 413 retrieves and updates all the state information with respect to the packet to be transmitted. The transmitter controller 413 passes the identifier information (i.e., *a pointer to one or more data packets*) to the transmitter DMA device 414 and the appropriate packet(s) is transferred to the transmitter buffer 415. The packet(s) is then transmitted onto the trunk (Col. 5, lines 10 plus). Furthermore, Duffield discloses a WFQ system implemented in routers and switches, in which the servicing of queues of different lengths

at different allocated rates is interleaved (*using interleaving data entry*) such that a packet from a first queue is serviced at time $t_{sub.1}$ and the packet of a second queue is serviced at a time $t_{sub.2}$. In the invention, the measure of worst case fairness is satisfied, such that, the time interval $t_{sub.2} - t_{sub.1}$, in the worst case, is less than or bounded by a value that is not a function of the number of connections, but is a function of the packet size of the longest queue, e.g., the queue serviced at time $t_{sub.1}$ and the allocated rate of that longest queue (See Fig. 2; Col. 5, lines 37 plus). Therefore, the Examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

Claim Rejections - 35 USC ' 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duffield et al. (US#6,452,933) in view of Braff et al. (US#5,166,930).

With respect to claims 15-17, both Duffield and Braff disclose a novel method and system for weighted fair queuing scheduler in routing packets from multiple queues, according to the essential features of the claims. Duffield et al. (US#6,452,933) provides a method and system for fair queue servicing at a queuing point in a multi-service class packet switched network. Fig. 2 illustrated a weighted fair queuing (WFQ) system implemented in routers and switches in a packet based communication system. The system consists of a set of queues 100, a shaper device 30a, . . . 30i associated with each queue, and Weighted Fair Queueing Server or Rate Proportional Server 40 and a State Dependent Server (SDS) 200. Packets are temporarily stored in the queues 20a, . . . 20i. A weight is assigned with each of these queues representing the portion of the output bandwidth that must be allocated to the packets arriving in each of the queues. The shaper device is forwarding packets from the queues to the Weighted Fair Queueing Server with a rate exactly equal to the allocated. This scenario enables excess bandwidth to become available for redistribution. In accordance with the principles of the invention, traffic from another source, i.e., another queue, may be directed to the adaptive bandwidth redistribution mechanism, which is hereafter referred to as state dependent scheduler 200 (Col. 4, lines 6 plus, and Col. 5, lines 55 plus).

In the same field of endeavor, Braff et al. (US#5,166,930) discloses a scheduling discipline for providing data devices access to the slotted packet data system, in which the information identifying one or more data packets of each data batch is sorted into one or more of a plurality (N) of epoch queues, such that for each data batch, no information identifying more than a predetermined number (P) of data packets from a particular channel is inputted into each epoch queue. Each epoch queue is then cyclically served exhaustively by outputting the identified data packets to the facility. Data that cannot be placed in the epoch queues is temporarily placed in an overflow queue. The overflow queue data is subsequently sorted into the epoch queues and transmitted (See also Figs. 5 & 9-20; Col. 1, lines 45 plus and Col. 17, lines 15 plus).

Regarding claims 1-6, they are method claims corresponding to the apparatus claims 15-17 above. Therefore, claims 1-6 are analyzed and rejected as previously discussed with respect to claims 15-17.

With respect to claims 22-25, these claims differ from claims Duffield in view of Braff in that the claims recited a computer program product for performing the same basis of steps and apparatus of the prior arts as discussed in the rejection of claims 1-6 and 15-17 above. It would have been obvious to a person of ordinary skill in the art to implement a computer program product in Duffield in view of Braff for performing the steps and apparatus as recited in the claims with the motivation being to provide the efficient enhancement to the scheduling packets from multiple queues in WFQ algorithm, and easy to maintenance, upgrade.

One skilled in the art would have recognized the need for effectively and efficiently scheduling packets from multiple queues in WFQ routing, and would have applied Braff's

teaching of the scheduling discipline utilizing epoch queues into Duffield's novel use of the WFQ system implemented in routers and switches for routing packets in a communication network. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Braff's data channel scheduling discipline arrangement and method into Duffield's fair queuing system with adaptive bandwidth redistribution with the motivation being to provide a method and system for scheduling packets from multiple queues utilizing interleaved WFQ mechanism.

Allowable Subject Matter

9. Claims 7-14, 18 and 26-31 are objected to as being dependent upon the rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

10. The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein the queue sequencer has access to a queue status register that indicates whether each queue identified in the interleaving table is empty or not, using the queue status register contents to step the pointer register to a next table entry within an epoch, when the queue status of the queue identified with the current entry indicates that the queue is empty, as specifically recited in the claims.

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11. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Aydemir et al. (US#6,771,652) is cited to show method and system for controlling transmission of packets in computer networks.

The Heddes et al. (US#6,674,718) is cited to show the unified method and system for scheduling and discarding packets in computer networks.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

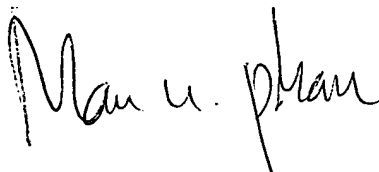
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149. The examiner can normally be reached on Mon - Fri from 6:00 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

Mphan

12/22/2004.

A handwritten signature in black ink that reads "Man u. phan". The signature is written in a cursive, slightly slanted style.

MAN U. PHAN
PRIMARY EXAMINER